CHEMICAL RELEASE INVENTORY

This paper sets out the Government's proposals for an annual inventory of releases of substances which cause pollution of the environment from industrial processes subject to control by Her Majesty's Inspectorate of Pollution (HMIP) under Part I of the Environmental Protection Act 1990 and the Radioactive Substances Act 1960, as amended by Part V of the 1990 Act. The inventory will cover both chemical releases and radioactive waste discharges and will be called a Chemical Release inventory.

Before finalising the arrangements, the Government is seeking comments from interested parties, in particular on:

- the use which is likely to be made of the inventory;
- the proposed arrangements for public access to data; and
- the information which should be included in tables to be published annually.

INTEGRATED POLLUTION CONTROL

Introduction

1. Part I of the Environmental Protection Act 1990 (the 1990 Act) introduced a system of integrated pollution control (IPC) in England and Wales with effect from 1 April 1991. Under IPC, operators of the most seriously polluting commercial, industrial and other processes subject historically to separate legislation relating to protection of air, water or land, are required - progressively, between 1991 and 1996 - to seek a single authorisation from HMIP to continue operating. And from 1 April 1991, all new plant or processes in the sectors specified for IPC require such an authorisation before they can begin operating. Applications submitted to Her Majesty's Inspectorate of Pollution (HMIP) must include an explanation of how the process is intended to operate, details of the polluting substances likely to be released from the process and an assessment of the environmental

consequences of releases of such substances. Applications are determined by HMIP in the context of a published guidance note for the process sector in question, prepared within the Inspectorate following wide-ranging consultation with both business and environmental groups.

2. An authorisation can only be granted if HMIP is satisfied that the applicant will be able to carry on the process in accordance with the conditions which will be included in it. These conditions will have the objective of ensuring that the process is carried on in such a way as to comply with any relevant national or international standards or objectives; and, in particular, will require the use of the best available techniques not entailing excessive cost (BATNEEC) to prevent or, where that is not practicable by such means, to minimise and render harmless polluting substances arising from the process. Wherever a process is likely to give rise to releases to more than one environmental medium, BATNEEC must be used to minimise pollution to the environment taken as a whole, having regard to the best practicable environmental option (BPEO).

3. The processes and substances prescribed for integrated pollution control and the timetable for bringing the processes within the new system are set out in the Environmental Protection (Prescribed Processes and Substances) Regulations, S.I. 1991/472; they are summarised at **Annexes I and II** of this paper.

Public Access to Environmental Information

4. The Government is firmly committed to the aim of making environmental information widely available to the public. This was made clear in the 1990 White Paper, "This Common Inheritance"; and the importance of public information and public participation was emphasised in the booklet "Green Rights and Responsibilities: a Citizen's Guide to the Environment" published by DOE in 1991. To this end, the Government is currently consulting on regulations which will provide a comprehensive system of public access to environmental information held by public authorities and has already instituted

a system of public registers of information in relation to a number of pollution control regimes. Internationally, the Government has committed itself to increasing public awareness and information about the effect of chemicals on the environment by virtue of its support for Agenda 21 at the Earth Summit in Brazil in June 1992. The measures it has already taken, or has in hand, will ensure compliance with EC requirements on public access to environmental information.

5. Not all sources of pollution come under HMIP control. Many industrial processes, for example, come instead under the new system of local authority air pollution control (also introduced by Part I of the 1990 Act). Discharges to water from non-IPC processes remain subject to control by the National Rivers Authority. And transport, agriculture and even domestic activities are all important sources of pollution. Information on the contribution to total releases of the most widespread pollutants which is made by each of these major source categories will continue to be available in other published material, such as the Department of the Environment's annual Digest of Environmental Protection and Water Statistics and the Statistical Report on the Environment, which was published on 14 October 1992.

IPC Information

6. A key feature of the new IPC system - and an indication of the Government's strong commitment to openness, public participation and public accountability - is the provision made for public involvement in the authorisation procedure and for public access to comprehensive information about the processes authorised. The Environmental Protection (Applications, Appeals and Registers) Regulations, S.I. 1991/507, require all applications for authorisation to be advertised so that the public may make representations to HMIP; certain bodies, such as the National Rivers Authority and English Nature or the Countryside Commission for Wales, to be formally consulted where appropriate; and authorisations and other relevant information to be placed in a register held by both HMIP and local

TABLE 1

Information to be included in IPC public register

a. all particulars of any application for an authorisation made to HMIP;

b. all particulars of any notice to an applicant to supply additional information in support of an application and the information itself;

c. all particulars of any representations made by statutory consultees;

d. all particulars of any authorisation granted by HMIP;

e. all particulars of any variation, enforcement or prohibition notice issued by HMIP;

f. all particulars of any notice withdrawing a prohibition notice;

g. all particulars of any notification of HMIP by the holder of an authorisation in response to a requirement of a variation notice under section 10(4)(a) of the Act;

h. all particulars of any application for the variation of the conditions of an authorisation;

i. all particulars of any revocation notice;

j. all particulars of any notice of appeal under section 15 of the Act and related documents, written notification of the Secretary of State's determination of such an appeal and any report accompanying any such written notification;

k. details of any conviction for any offence under section 23(1) of the 1990 Act, including the name of the offender, the date of conviction, the penalty imposed and the Court;

l. all particulars of any monitoring information relating to an IPC process obtained by HMIP as a result of its own monitoring or furnished in writing by virtue of a condition of the authorisation or section 19(2) of the Act;

m. a statement by HMIP where monitoring information is omitted from the register on the grounds of commercial confidentiality, indicating whether or not there has been compliance with any relevant condition of the authorisation;

n. all particulars of any report published by HMIP relating to an assessment of the environmental consequences of the carrying on of an IPC process in the locality of premises where the process is carried on; and

o. a copy of any direction given to HMIP by the Secretary of State under Part I of the Act, other than a direction relating to national security matters.

N.B. Information which affects national security or is commercially confidential, by virtue of sections 21 and 22 of the Act respectively, is excluded from the public register.

authorities and made available for scrutiny by the public. The information to be shown in the register is set out in **Table 1**. It gives members of the public a comprehensive view of what is being done to control pollution from these processes - both by the process operator and by HMIP as the enforcing authority - and it will enable people both to make an informed contribution to the authorisation process and to become their own "environmental watchdog".

7. Once an authorisation is in force, the attention of both the enforcing authority (HMIP) and the public will focus on the performance of the operator in complying with the requirements laid down and on the nature and quantity of polluting substances released. The inclusion in the register of monitoring data obtained by HMIP, or supplied to it by the operator, is therefore an essential element in the system. It will provide important information to the operator about the operation of the process, which should form part of a comprehensive management information system; it will give the public a detailed picture of the effect of the process on the surrounding environment; and it will demonstrate compliance with the standards laid down as a condition of authorisation.

An annual inventory of IPC pollutants?

8. The IPC system already provides for a substantial body of information to be made publicly available. But the Government has considered whether there would be advantage in going further by aggregating data on releases in the IPC public register and making this information available in the form of an annual inventory.

9. Reports on the effects of the toxics release inventory (TRI) initiated by the United States Environmental Protection Agency suggest that annual aggregation of releases of polluting substances from major sources can help regulatory bodies to identify and target environmental "blackspots"; provides senior managers with a clear cut picture of the environmental consequences of their operations; and gives the public and

environmental groups additional information which can be used to encourage industry to look for ways of reducing releases, or of eliminating them altogether by the introduction of cleaner technology.

10. The U.S Toxics Release Inventory is a free-standing model, ie. the information is not collected for any other purpose, which has been compiled for each year since 1987. The latest information available, for 1990, was published in May 1992. The TRI applies to manufacturing facilities (subject to certain thresholds), which are required to report (estimates or measurements) any annual releases and off-site transfers of over 300 toxic chemicals by July following the year in question. It provides that: for every listed chemical released from every facility covered by the law into each environmental medium (air, land and water), information should be supplied in a standard format (expressed in pounds released per year). The information is made available in a number of ways; including releases by substance, by medium, by manufacturing sector, by company and by State; and a year-on-year comparison can be made.

11. In the UK, Parliament has recently enacted a major piece of environmental protection legislation - the Environmental Protection Act 1990 - which introduced the new system of Integrated Pollution Control. Over the period to 1996 all major industrial polluting processes will be subject to authorisation and the imposition of a tighter system of control than ever before. And, as explained in paragraphs 6 and 7 above, one of the key features of the system is the extensive provision it makes for public information and participation in the regulatory process. The new framework of IPC therefore provides an opportunity to establish machinery which draws on the TRI concept while adapting it to UK circumstances.

The Government's Proposals

12. In order to gain most from an inventory, the Government considers it important to link it firmly to the newly established regulatory mechanisms under the Environmental Protection Act.

Where information about releases of pollutants to the environment is required as a condition of an authorisation in order to demonstrate compliance, there is much less likelihood that either the information required for an inventory will be delayed or not supplied, or that the data will be inaccurate. More importantly, the Government believes it is particularly important that the data contained in an annual inventory should not be looked at in isolation. The inventory should be complementary to, not a substitute for, the more comprehensive public register database compiled from information required to be supplied to authorising bodies as part of the regulatory process. It is also important that the creation of an annual inventory should not duplicate requirements on operators of processes and place an unjustified burden on them, in terms of cost or other resources.

An IPC Chemical Release Inventory

13. Under IPC, operators will have to undertake monitoring of releases and submit relevant information as a condition of authorisation in order to demonstrate compliance with the standards set; and failure to provide that information will constitute a breach of authorisation, which can lead to enforcement action by HMIP. All such information will be required to be placed in the public register alongside other key documents relating to the authorisation of processes (see **Table 1** above). The Government proposes that the results of relevant monitoring carried out in relation to authorisations should be aggregated, on an annual basis, and made available to the public as part of the IPC register system. This would guarantee that the information produced was comprehensive, as accurate as possible and could be assessed fully in the context of details about the operation of, and the authorised release limits for, the processes to which the information relates. It would also enable HMIP to present a clear picture of the incidence of releases from those processes with the greatest potential to pollute the environment, and the relationship of those releases to authorised limits.

TABLE 2: THE SCOPE OF IPC

YEAR	INDUSTRY	MAJOR RELEASES
1992/93	**Fuel & Power**	
	Combustion Processes Crude Oil Refineries Gasification	Air: Particulate matter, carbon dioxide, Nitrogen Oxides, Sulphur dioxide Land: Alkaline earth metal oxides. Water: Mercury, Cadmium.
	Minerals	
	Cement and Lime manufacture Asbestos processes Glass processes Ceramic processes	Air: Particulate matter, carbon dioxide, sulphur dioxide, nitrogen oxides, halogens and their components. Land: Alkaline earth metals oxides. Water: None
	Waste	
	Municipal/Clinical incinerators	Air: Particulate matter, nitrogen oxides, sulphur dioxide Land: Alkaline metals and their oxides, PCBs, PCDDs, PCDFs Water: Mercury; cadmium
1993/94	**Chemical**	
	Organic chemical processes Acid processes	Embrace virtually all prescribed substances
	Halogen processes Inorganic chemical processes	
	Chemical fertilizers Pesticide processes Pharmaceutical processes	May affect all environmental media

1995/96	Metal	
	Iron & steel making Foundry processes Non-ferrous metals processes	)Air: Particulate matter, carbon monoxide, carbon dioxide; Fluoride; Heavy Metals, Hydrogen Sulphide Sulphide Sulphur dioxide, Halogens and organohalides, Other heavy metals, Phosphorous and P_2Os, Silica.)Land: Alkali metals compounds; Alkaline Earth compounds, Hydro-carbons, Halogens and Organolialides, chromium, Silica.)Water: Cadmium, Mercury; Oils and emulsions; phosphates and and stearatis.
	Others	
	Paper manufacture	May affect all environmental media Air: Sulphur dioxide, H_2s. Vocs, Lindane, PCP, Particulate matter
	Timber processes	Hexachlorabenzene; Toluene di-isocyanate Water: TBT, Lindane, PCP, PCB Land: Solvents, TBT, Lindane, PCP.

NB: Processes listed under industry sectors and substances listed under major releases are illustrative only; this table is not definitive.

PCBs – Polychlorinated biphenyls
PCDDs – Polychlorinated di-benzo dioxins
PCDFs – Polychlorinated di-benzo furans

PCB – Polychlorinated biphenyls
PCP – Pentachlorophenol
TPT – Tributyl tin
H_2S – Hydrogen Sulphide

14. It is proposed that HMIP should compile an inventory from monitoring data required under IPC authorisations for each calender year from 1992 onwards. Releases from processes will be included from the date on which they are authorised by HMIP. This means that the inventory, like the IPC system itself, will expand between 1992 and 1996, broadly as indicated in **Table 2.** As data is entered into the inventory from authorisations issued in the coming years, a picture will be built up of the quantities of prescribed substances released as will trends or patterns of releases in both geographical and industry terms.

15. The substances covered in the IPC inventory will be those identified in authorisations issued by HMIP as sufficiently important in the context of each process to require the imposition of prescribed limits on release. The list at **Annex II** contains 44 entries relating to substances prescribed for IPC (in addition to 1 category covering all radionuclides; see paras 19 - 21): but these entries actually cover thousands of individual chemicals, and significant releases of any non-prescribed substances may also be subject to authorised limits and therefore included in the inventory. It is expected that a number approaching the 300-odd substances covered by the U.S. TRI will eventually be specified by HMIP in authorisations. An initial list is included in **Annex III.** The database will be compiled by HMIP from the substances and quantities specified in authorisations and from monitoring information provided by operators; and it is intended that the annual inventory will be published within 3/4 months of the end of the year in question.

16. The information recorded from each authorisation will comprise:

- its reference number,
- the name of the authorised operator,
- the prescribed process or processes,
- HMIP's IPC Process code,
- the local authority area in which the process is being carried on,
- the prescribed substance or substances authorised for release and any non-prescribed substances included in the

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authorisation for which release limits have been set, and

- the quantity of each substance authorised for release, for each calender year during which the authorisation is valid - to four significant figures over a range of $1\times10^{\pm12}$ kilograms.

Data which will then become available as an automatic consequence of the above entries includes:

- where applicable, the prescribed substance group or groups to which an authorised substance belongs, ("substance groups" are the 48 entries at **Annex II**),
- the medium, ie. air, water or the land, into which the substance is authorised for release,
- the process and industry type (the "Chapter" and "Section" headings respectively in **Annex I**), and
- the county, country (England or Wales) and HMIP Region and Division in which the process is located.

The relationships between these data items is illustrated in the simplified data model at **Annex IV**.

17. Over 150 substances will be included initially as reference data, as will the relevant local authorities, process schedule references, and the Inspectorate's own Process codings. Additional substances will be entered as required by specific authorisations. As each authorisation is issued, substance release limit data will be recorded in the inventory. Authorisations will also require that, at given intervals - and at least annually - operators must provide HMIP with monitoring data indicating **actual** quantities of each authorised substance released, in standard form - measured mass. Where direct measurement is not practicable, quantity will be calculated by HMIP from an inferential measurement agreed in advance with the operator or, as a last resort, estimated in accordance with an agreed procedure. In addition, operators will be required, as a condition of authorisation, to report the release of any substance in excess of authorised limits and of any substance not included in the authorisation. This is to be done at the time of the unauthorised release and the total of any unauthorised

releases will be recorded in the inventory at the year end - as will any releases in excess of authorised limits identified by HMIP as a result of monitoring which it carries out.

18. Releases, and authorised limits, will all be expressed in kilograms and substance quantities may be aggregated and reported in many combinations of the parameters in paragraph 16 above, in listings of up to six headings drawn from them. Quantity data will be recorded and reported to four significant figures, in exponential format which allows the management and presentation of data for annual quantities released ranging from fractions of a gram to many kilograms. A typical report might contain the total quantities of each of three substances released into one or more media by all of a particular industry located in a specified geographical area comprising one or more local authorities. The illustrative example report at **Annex V** indicates one way in which data might be presented in response to an enquiry.

RADIOACTIVE SUBSTANCES

19. The keeping and use of radioactive material and the accumulation and disposal of radioactive waste are regulated under the Radioactive Substances Act 1960, as amended by the Environmental Protection Act 1990. Any person releasing radioactive material into the environment must, unless covered by a specific exemption, be authorised for the disposal of radioactive waste by HMIP and, in the case of releases from the licensed nuclear sites, authorisation by the Minister of Agriculture, Fisheries and Food is also required. Authorisations are granted subject to limitations and conditions, and it is a feature of the system of control of the major nuclear sites that discharges of radioactive waste should be kept not only within the prescribed limits but as far below them as can reasonably be achieved. Those authorisations therefore require the site operator to use the Best Practicable Means (BPM) to minimise the discharge, so as to meet the objective that radiation doses to the public will be As Low As Reasonably Achievable (ALARA).

20. As a result of amendments to the Radioactive Substances Act 1960, the public has access at both HMIP and local authority offices to a wide range of documents issued under the provisions of the Act. These documents include applications for authorisations, certificates of authorisation and monitoring information relating to discharges of radioactive waste. The Government now proposes to include details of releases of radionuclides in the annual inventory of pollutants, which will further increase the information available to the public on the subject of radioactivity. Radionuclides authorised for release by HMIP and, where appropriate, MAFF (see **Annex III** for an initial, illustrative list) will be included, whether or not they are discharged from premises where an IPC process is carried out, and the information recorded from each authorisation will comprise:

- its reference number;
- the name of the authorised operator;
- the radionuclides authorised for disposal;
- the quantity of each radionuclide or group of radionuclides authorised for disposal, for each calender year during which the authorisation is valid - to four significant figures up to $1\text{x}10^{19}$ becquerels;
- HMIP's radioactive substances user classification code;
- the local authority area in which the authorised premises are situated.

21. Data which will become available as a result of the above entries includes the medium (ie. air, water or land) into which the radionuclides are discharged, and the county, country (England or Wales) and HMIP Region and Division in which the authorised premises are situated. The relationships between these data items is illustrated in the simplified data model at **Annex IV**.

22. All new authorisations, and all revisions to existing authorisations, issued on or after 1 January 1992 include conditions requiring the provision of the information needed for the inventory. The radioactive substances coverage of the

inventory will consequently increase each year as data from authorisations granted during the year is included.

PUBLIC ACCESS TO INVENTORY INFORMATION

23. The Government has considered a number of mechanisms for making the inventory information available to the public. As a starting point, base data - namely, the aggregated annual quantities of releases of substances from each process - will be available in the relevant (IPC or radioactive substances) public register maintained by HMIP, subject to any exclusions on grounds of commercial confidentiality, which are expected to be very limited. And, as a consequence, full local information will be available from the local authority held copy of these registers. But this alone will not provide easy access to all the data - such as a comparison of releases of a given substance from different industry sectors - which a full inventory can offer.

24. In addition, therefore, the Government proposes that the Chemical Release Inventory will provide the following enhancements to the public register system:-

(i) in the light of responses to this consultation paper, HMIP will identify a series of comparative tables which will be published annually. These might include total or substance-specific releases by industry sector or sub-sector; geographic spread of releases of a given substance; actual releases as a percentage of authorised release limits; and quantities and sources of unauthorised releases.

(ii) in recognition of the fact that only a totally comprehensive series of tables would meet every conceivable requirement for comparative data, HMIP will provide a full enquiry service at its 3 regional headquarters offices in Bristol, Leeds and Bedford. This will enable the public and interested organisations to obtain information on any combination of items not covered by the published tables.

(iii) for those organisations which consider they have a need for detailed and regular reports, HMIP will demonstrate the features of the inventory's reporting facilities and discuss specific requirements for information and the frequency of preparation of data.

25. Initially, the inventory will be an interim system, specifically designed for the purpose and hence capable of relatively rapid introduction, pending the development of HMIP's planned, comprehensive corporate information system. The interim system will inevitably not be as readily accessible as would be ideal; but once HMIP have developed their new system it should be possible to move to a much higher degree of user-friendliness and this will certainly be the aim.

CONCLUSION

26. The above proposals relate to releases from processes subject to integrated pollution control and to controls on the discharge of radioactive waste. These are generally the sources with the greatest potential to pollute, which involve significant releases to more than one environmental medium, or which make a significant contribution to cross-media pollution. For the reasons set out in this consultation paper, the Government considers it desirable to extend the current arrangements for public access to environmental information in respect of those processes authorised by HMIP under Part I of the 1990 Act and the Radioactive Substances Act 1960, as amended by Part V of the 1990 Act, to include a Chemical Release Inventory with effect from the end of 1992.

27. Comments on this paper are invited by 22 January 1993. They should be sent to:

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ANNEX I

TIMETABLE FOR IMPLEMENTING INTEGRATED POLLUTION CONTROL

EPA Sched. 1 Ref	Process	Comes within IPC	Apply Between
	Fuel & Power Industry		
1.3	Combustion (>50MWth) Boilers and Furnaces	1.4.91	[1.4.91] & 30.4.91
1.1	Gasification	1.4.92	1.4.92 & 30.6.92
1.2	Carbonisation	1.4.92	1.4.92 & 30.6.92
1.3	Combustion (remainder)	1.4.92	1.4.92 & 30.6.92
1.4	Petroleum	1.4.92	1.4.92 & 30.6.92
	Waste Disposal Industry		
5.1	Incineration	1.8.92	1.8.92 & 31.10.92
5.2	Chemical Recovery	1.8.92	1.8.92 & 31.10.92
5.3	Waste Derived Fuel	1.8.92	1.8.92 & 31.10.92
	Mineral Industry		
3.1	Cement	1.12.92	1.12.92 & 28.2.93
3.2	Asbestos	1.12.92	1.12.92 & 28.2.93
3.3	Fibre	1.12.92	1.12.92 & 28.2.93
3.5	Glass	1.12.92	1.12.92 & 28.2.93
3.6	Ceramic	1.12.92	1.12.92 & 28.2.93

EPA Sched.1 Ref	Process	Comes Within IPC	Apply Between
	Chemical Industry		
4.1	Petrochemical	1.5.93	1.5.93 & 31.7.93
4.2	Organic	1.5.93	1.5.93 & 31.7.93
4.7	Chemical Pesticide	1.5.93	1.5.93 & 31.7.93
4.8	Pharmaceutical	1.5.93	1.5.93 & 31.7.93
4.3	Acid Manufacturing	1.11.93	1.11.93 & 31.1.94
4.4	Halogen	1.11.93	1.11.93 & 31.1.94
4.6	Chemical Fertiliser	1.11.93	1.11.93 & 31.1.94
4.9	Bulk Chemical Storage	1.11.93	1.11.93 & 31.1.94
4.5	Inorganic Chemical	1.5.94	1.5.94 & 31.7.94
	Metal Industry		
2.1	Iron and Steel	1.1.95	1.1.95 & 31.3.95
2.3	Smelting	1.1.95	1.1.95 & 31.3.95
2.2	Non-ferrous	1.5.95	1.5.95 & 31.7.95
	Other Industry		
6.1	Paper Manufacturing	1.11.95	1.11.95 & 31.1.96
6.2	Di-isocyanate	1.11.95	1.11.95 & 31.1.96
6.3	Tar and Bitumen	1.11.95	1.11.95 & 31.1.96
6.4	Uranium	1.11.95	1.11.95 & 31.1.96
6.5	Coating	1.11.95	1.11.95 & 31.1.96
6.6	Coating Manufacturing	1.11.95	1.11.95 & 31.1.96
6.7	Timber	1.11.95	1.11.95 & 31.1.96
6.9	Animal and Plant Treatment	1.11.95	1.11.95 & 31.1.96

SUBSTANCE GROUPS

SUBSTANCE GROUP ID	SUBSTANCE GROUP NAME	MEDIA ID
01	Radionuclides	A/L/W
02	Oxides of sulphur and other sulphur compounds	A
03	Oxides of nitrogen and other nitrogen compounds	A
23	Oxides of carbon	A
06	Organic compounds and partial oxidation products	A
06	Metals, metalloids and their compounds	A
07	Asbestos, glass fibres and mineral fibres	A
06	Halogens and their compounds	A
09	Phosphorus and its compounds	A
06	Particulate matter	A
11	Mercury and its compounds	W
12	Cadmium and its compounds	W
13	All isomers of hexachlorocylohexane	W
14	All isomers of DDT	W
15	Pentachlorophenol and its compounds	W
06	Hexachlorobenzene	W
17	Hexachlorobutadiene	W
06	Aldrin	W
06	Dieldrin	W
20	Endrin	W
21	Polychlorinated Biphenyls	W
22	Dichlorvos	W
23	1,2-Dichloroethane	W
24	All isomers of trichlorobenzene	W
25	Atrazine	W
26	Simazine	W
27	Tributyltin compounds	W
28	Triphenyltin compounds	W
29	Trifluralin	W
30	Fenitrothion	W
31	Azinphos-methyl	W
32	Malathion	W

SUBSTANCE GROUP ID	SUBSTANCE GROUP NAME	MEDIA ID
33	Endosulfan	W
34	Organic solvents	L
35	Azides	L
35	Halogens & their covalent compounds	L
37	Metal carbonyls	L
48	Organo-metallic compounds	L
39	Oxidisisng agents	L
40	Polychlorinated dibenzofuran and any congener thereof	L
41	Polychlorinated dibenzo-p-dioxin and any congener thereof	L
42	Polyhalogenated biphenyls,terphenyls and naphthalene	L
43	Phosphorus	L
44	Pesticides	L
45	Alkali metals & their oxides & alkaline earth metals & their oxides	L
46	Non-Prescribed Substances	A
47	Non-Prescribed Substances	W
48	Non-Prescribed Substances	L

CRI SUBSTANCE LIST

(with Substance and Media IDs)

SUBSTANCE NAME	SUBSTANCE GROUP ID No.	MEDIA ID
	(See Annex II)	A=Air, W=Water, L=Land
ACETALDEHYDE	05	A
ACRYLIC ACID	05, 34	A/L
ACRYLONITRILE	05	A
ALDRIN	05,18,44	A/W/L
AMERICIUM 243	01	A/L/W
AMERICIUM 241	01	A/L/W
AMERICIUM 241 (MIXED WITH BERYLLIUM)	01	A/L/W
AMMONIA	03	A
AMMONIUM NITRATE	03,39	A/L
AMMONIUM SULPHATE	02,03	A
ANILINE	03,05,34	A/L
ANTHRACENE	05	A
ANTHRAQUINONE	05	A
ANTIMONY	06	A
ANTIMONY COMPOUNDS - TOTAL	06	A
ARGON 41	01	A/L/W
ARSENIC COMPOUNDS - TOTAL	06	A
ARSENIC	06	A
ASBESTOS (SUS. PARTICS. & FIBRES)	07	A
ATRAZINE	05,25	A/W
AZINPHOS-METHYL	05,31,44	A/W/L
BARIUM OXIDE	06,45	A/L
BARIUM CPDS (NOT SULPHATE) TOTAL	06	A

SUBSTANCE NAME	SUBSTANCE GROUP ID No.	MEDIA ID
	(See Annex B)	A=Air, W=Water, L=Land
BARIUM	06,45	A/L
BARIUM SULPHATE	06	A
BENZAMIDE	03,05	A
BENZENE	05,34	A/L
BERYLLIUM	06	A
BERYLLIUM COMPOUNDS - TOTAL	06	A
BROMINE 82	01	A/L/W
BROMINE	08,36	A/L
BUTADIENE (1,3-)	05	A
BUTYL ACRYLATE (N-)	05,34	A/L
CADMIUM	06.12	A/W
CADMIUM COMPOUNDS - TOTAL	06.12	A/W
CADMIUM 109	01	A/L/W
CAESIUM 135	01	A/L/W
CAESIUM 137	01	A/L
CAESIUM 134	01	A/L/W
CALCIUM 45	01	A/L/W
CALCIUM 41	01	A/L/W
CALIFORNIUM 252	01	A/L/W
CARBON 14	01	A/L/W
CARBON TETRACHLORIDE	05,08,34,36	A/L
CARBON MONOXIDE	04	A
CARBON DISULPHIDE	02,34	A/L
CARBON DIOXIDE	04	A
CERIUM 144	01	A/L/W
CHLORINE	08,36	A/L
CHLORINE 36	01	A/L/W
CHLORINE DIOXIDE	08	A

SUBSTANCE NAME	SUBSTANCE GROUP ID No.	MEDIA ID
	(See Annex II)	A=Air, W=Water, L=Land
CHLOROBENZENE	05,08,36	A/L
CHLOROFORM	05,08,34,36	A/L
CHLOROPHENOLS - TOTAL	05,08,36	A/L
CHROMIUM 51	01	A/L/W
CHROMIUM COMPOUNDS - TOTAL	06	A
CHROMIUM	06	A
COBALT	06	A
COBALT 57	01	A/L/W
COBALT COMPOUNDS - TOTAL	06	A
COBALT 60	01	A/L/W
COBALT 58	01	A/L/W
COPPER	06	A
COPPER COMPOUNDS - TOTAL	06	A
CRESOL - ALL ISOMERS - TOTAL	05,34	A/L
CURIUM 244	01	A/L/W
CURIUM 246	01	A/L/W
CURIUM 243	01	A/L/W
CURIUM 242	01	A/L/W
CURIUM 245	01	A/L/W
DDT - ALL ISOMERS	05,14,44	A/W/L
DICHLORVOS	05	A
DIELDRIN	05,19,44	A/W/L
DIMETHYL SULPHATE	02,05,34	A/L
DINOSEB	03,05,44	A/L
ENDOSULFAN	05,33,44	A/W/L
ENDRIN	05,20,44	A/W/L
ETHYL ACRYLATE	05,34	A/L
ETHYLAMINE	03,05,34	A/L

SUBSTANCE NAME	SUBSTANCE GROUP ID No.	MEDIA ID
	(See Annex II)	A=Air, W=Water, L=Land
ETHYLBENZENE	05,34	A/L
ETHYLENE	05	A
ETHYLENE DICHLORIDE (1,2-DICHLOROETHANE)	05,08,34,36	A/L
ETHYLENE OXIDE	05	A
EUROPIUM 145	08	A/L/W
FENITROTHION	05,30,44	A/W/L
FORMALDEHYDE	05	A
GALLIUM 67	01	A/L/W
GLASS FIBRES	07	A
GOLD 198	01	A/L/W
HEXACHLOROBENZENE	05,08,16,36	A/W/L
HEXACHLOROBUTADIENE	05,08,17,36	A/W/L
HEXACHLOROCYCLOHEXANE	05,08,13,36,44	A/W/L
HYDROCARBON VAPOUR UNSPEC TOTAL	05	A
HYDROCHLORIC ACID	05	A
HYDROGEN CYANIDE	03	A
HYDROGEN FLUORIDE	05	A
HYDROGEN BROMIDE	08	A
HYDROGEN IODIDE	05	A
HYDROGEN PEROXIDE	39	L
HYDROGEN SULPHIDE	02	A
INDIUM 111	01	A/L/W
IODINE 123	01	A/L/W
IODINE 125	01	A/L/W
IODINE 129	01	A/L/W
IODINE 131	01	A/L/W
IODINE	08,36	A/L
IRIDIUM 192	01	A/L/W

SUBSTANCE NAME	SUBSTANCE GROUP ID No.	MEDIA ID
	(See Annex II)	A=Air, W=Water, L=Land
IRON	06	A
IRON 55	01	A/L/W
ISOPROPYLAMINE	03,05,34	A/L
KRYPTON 85	01	A/L/W
KRYPTON 81	01	A/L/W
LEAD COMPOUNDS - TOTAL	06	A
LEAD	06	A
LEAD 210	01	A/L/W
M'LENE BIS-O-CHLOROANALINE	05,08.36	A/L
MAGNESIUM OXIDE	06	A
MALATHION	02,05,32,44	A/W/L
MALEIC ANHYDIDE	05	A
MANGANESE	06	A
MANGANESE COMPOUNDS - TOTAL	06	A
MANGANESE 54	01	A/L/W
MERCURY	06,11	A/W
MERCURY COMPOUNDS - TOTAL	06,11	A/W
MERCURY 203	01	A/L/W
METHANE	05	A
METHANOL	05,34	A/L
METHYL METHACRYLATE	05	A
METHYL ISOBUTYL KETONE	34	L
METHYL ACRYLATE	05	A
METHYL ETHYL KETONE	05,34	A/L
METHYLENE CHLORIDE	05,08.34,36	A/L
METHYLENE DIANALINE	03,05	A
MINERAL FIBRES - NOT ASBESTOS/GLASS	07	A
MOLYBDENUM 99	01	A/L/W

SUBSTANCE NAME	SUBSTANCE GROUP ID No.	MEDIA ID
	(See Annex II)	A=Air, W=Water, L=Land
MOLYBDENUM	06	A
MOLYBDENUM TRIOXIDE	06	A
NAPHTHALENE	05,44	A/L
NEPTUNIUM 237	01	A/L/W
NICKEL COMPOUNDS - TOTAL	06	A
NICKEL 59	01	A/L/W
NICKEL	06	A
NICKEL 63	01	A/L/W
NIOBIUM 93M	01	A/L/W
NIOBIUM 94	01	A/L/W
NIOBIUM 95	01	A/L/W
NITRIC ACID	03,39	A/L
NITROBENZENE	03,05,34	A/L
NITROGEN OXIDES (AS NO2)	03	A
NITROMETHANE	03,05	A
NITROPHENOLS - TOTAL	03,05	A
OTHER ALPHA-EMITTING RADIONUCLIDES - TOTAL	01	A/L/W
OTHER RADIONUCLIDES EXCEPT ALPHA-EMITTERS - TOTAL	01	A/L/W
PALLADIUM 107	01	A/L/W
PARTICULATES	10	A
PENTACHLOROPHENOL	05,08,15,36,44	A/W/L
PENTACHLOROPHENOL COMPOUNDS - TOTAL	05,08,15,36,44	A/W/L
PHENOL	05	A
PHOSPHORIC ACID	09	A
PHOSPHORUS 32	01	A/L/W
PHOSPHORUS	09,43	A/L
PHOSPHORUS PENTOXIDE	09	A
PHTHALIC ANHYDRIDE	05	A

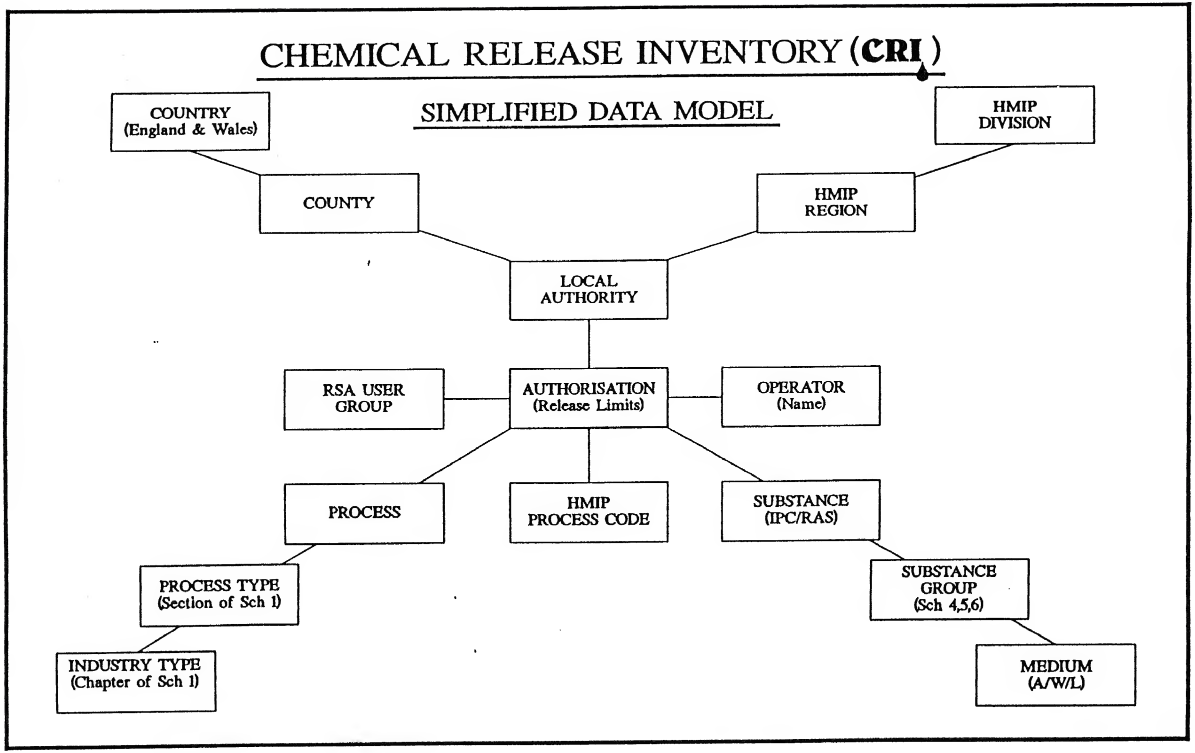
SUBSTANCE NAME	SUBSTANCE GROUP ID No.	MEDIA ID
	(See Annex II)	A=Air, W=Water, L=Land
PICRIC ACID	03,05	A
PLUTONIUM 238	01	A/L/W
PLUTONIUM 239	01	A/L/W
PLUTONIUM 240	01	A/L/W
PLUTONIUM 241	01	A/L/W
PLUTONIUM 242	01	A/L/W
PLUTONIUM ALPHA	01	A/L/W
POLONIUM 210	01	A/L/W
POLYBROMINATED BIPHENYLS - TOTAL	42	L
POLYBROMINATED NAPHTHALENES - TOTAL	42	L
POLYBROMINATED TERPHENYLS - TOTAL	42	L
POLYCHLORINATED TERPHENYLS - TOTAL	42	A
POLYCHLORINATED DIBENZOFURAN - ALL CONGENERS	40	L
POLYCHLORINATED NAPHTHALENES - TOTAL	42	L
POLYCHLORINATED BIPHENYLS - TOTAL	21,42	W/L
POLYCHLORINATED DIBENZO-P-DIOXIN - ALL CONGENERS	41	L
PRASEODYMIUM 144	01	A/L/W
PROACTINIUM 231	01	A/L/W
PROMETHIUM 144	01	A/L/W
PROMETHIUM 147	01	A/L/W
PROPYLENE OXIDE	05	A
PROPYLENE	05	A
PYRIDINE	03	A
RADIUM 226	01	A/L/W
RADIUM 226 (MIXED WITH BERYLLIUM)	01	A/L/W
RHODIUM 106	01	A/L/W
RUBIDIUM 84	01	A/L/W
RUTHENIUM 103	01	A/L/W

SUBSTANCE NAME	SUBSTANCE GROUP ID No.	MEDIA ID
	(See Annex II)	A=Air, W=Water, L=Land
RUTHENIUM 106	01	A/L/W
SAMARIUM 151	01	A/L/W
SCANDIUM 47	01	A/L/W
SELENIUM 75	01	A/L/W
SELENIUM COMPOUNDS - TOTAL	06	A
SELENIUM 79	01	A/L/W
SELENIUM	06	A
SILVER 108M	01	A/L/W
SILVER	06	A
SILVER 110M	01	A/L/W
SILVER COMPOUNDS - TOTAL	06	A
SIMAZINE	44	L
SODIUM 22	01	A/L/W
SODIUM OXIDE	06,45	A/L
SODIUM 24	01	A/L/W
SODIUM HYPOCHLORITE	08	A
STRONTIUM 89	01	A/L/W
STRONTIUM 90	01	A/L/W
STYRENE	05,34	A/L
SULPHUR DIOXIDE	02	A
SULPHUR TRIOXIDE	02	A
SULPHUR 35	01	A/L/W
SULPHURIC ACID	02	A
TANTALUM 182	01	A/L/W
TECHNETIUM 99M	01	A/L/W
TECHNETIUM 99	01	A/L/W
TETRACHLORETHANE	05,08,34	A/L
TETRACHLORETHYLENE	05,08,34	A/L

SUBSTANCE NAME	SUBSTANCE GROUP ID No.	MEDIA ID
	(See Annex II)	A=Air, W=Water, L=Land
THALLIUM 204	01	A/L/W
THORIUM - NATURAL	01	A/L/W
THORIUM 229	01	A/L/W
THORIUM 230	01	A/L/W
THORIUM 232	01	A/L/W
THULIUM 170	01	A/L/W
TIN COMPOUNDS NOT ORGANIC - TOTAL	06	A
TIN 121M	01	A/L/W
TIN 126	01	A/L/W
TITANIUM TETRACHLORIDE	06,08	A
TOLUENE	05,34	A/L
TOLUENE DIISOCYANATE - ALL ISOMERS	03,05	A
TRIBUTYL TIN OXIDE	05,27,38,44	A/W/L
TRICHLOROBENZENE - ALL ISOMERS	05,08,24,34,36	A/W/L
TRICHLOROETHANE (1,1,1-)	05,08,34,36	A/L
TRICHLOROETHYLENE	05,08,34.36	A/L
TRIFLURALIN	03,29,44	A/W/L
TRIPHENYL TIN OXIDE	05,28,38,44	A/W/L
TRITIUM (IN SEALED GLASS TUBE)	01	A/L/W
TRITIUM AND CARBON 14	01	A/L/W
TRITIUM	01	A/L/W
TRITIUM (IN METAL FOIL)	01	A/L/W
URANIUM 233	01	A/L/W
URANIUM 235	01	A/L/W
URANIUM 236	01	A/L/W
URANIUM 238	01	A/L/W
URANIUM 244	01	A/L/W
URANIUM - DEPLETED	01	A/L/W

SUBSTANCE NAME	SUBSTANCE GROUP ID No.	MEDIA ID
	(See Annex II)[1]	A=Air, W=Water, L=Land
URANIUM - NATURAL	01	A/L/W
UREA	03,05	A
VANADIUM PENTOXIDE	06	A
VINYL ACETATE	05,34	A/L
VINYL CHLORIDE	05,08,36	A/L
VINYLIDENE CHLORIDE	05,08,34,36	A/L
XENON 133	01	A/L/W
XYLENE	05,34	A/L
YTTERBIUM 169	01	A/L/W
YTTRIUM 90	01	A/L/W
YTTRIUM 91	01	A/L/W
ZINC 65	01	A/L/W
ZINC	06	A
ZINC COMPOUNDS - TOTAL	06	A
ZIRCONIUM 93	01	A/L/W
ZIRCONIUM 95	01	A/L/W

ANNEX IV



CHEMICAL RELEASE INVENTORY (CRI)

SIMPLIFIED DATA MODEL

COUNTRY (England & Wales)
COUNTY
HMIP DIVISION
HMIP REGION
LOCAL AUTHORITY
RSA USER GROUP
AUTHORISATION (Release Limits)
OPERATOR (Name)
PROCESS
HMIP PROCESS CODE
SUBSTANCE (IPC/RAS)
PROCESS TYPE (Section of Sch 1)
SUBSTANCE GROUP (Sch 4,5,6)
INDUSTRY TYPE (Chapter of Sch 1)
MEDIUM (A/W/L)

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                          HMIP CHEMICAL RELEASE INVENTORY                                   01 September 1992
COUNTY
   INDUSTRY
      SUBSTANCE
         MEDIUM
            OPERATOR
               YEAR                                                          [--------- all quantities in kilograms ---------]
                                                                 AUTHNO       LIMIT        ACTUAL        UNAUTH
-----------------------------------------------------------------------------------------------------------------
AVON
   THE CHEMICAL INDUSTRY
      CHLORINE
         AIR
            JONSTU PLC
               1992 . . . . . . . . . . . . . . . .              ZZ9998       1.000 E2     0.500 E2
                                       Total: 1992=                           1.000 E2     0.500 E2      0.000 E0
               1993 . . . . . . . . . . . . . . . .              ZZ9998       1.000 E2     0.400 E2      0.700 E2
                                       Total: 1993=                           1.000 E2     0.400 E2      0.700 E2
               1994 . . . . . . . . . . . . . . . .              ZZ9998       1.000 E2     0.300 E2
                                       Total: 1994=                           1.000 E2     0.300 E2      0.000 E0

                                   Total: JONSTU PLC=                         3.000 E2     1.200 E2      0.700 E2

            STUJON PLC
               1992 . . . . . . . . . . . . . . . .              XX0001       1.000 E2     0.700 E2
                                       Total: 1992=                           1.000 E2     0.700 E2      0.000 E0
               1993 . . . . . . . . . . . . . . . .              XX0001       1.000 E2     0.400 E2      0.200 E2
                                       Total: 1993=                           1.000 E2     0.400 E2      0.200 E2
               1994 . . . . . . . . . . . . . . . .              XX0001       1.000 E2     0.800 E2
                                       Total: 1994=                           1.000 E2     0.800 E2      0.000 E0

                                   Total STUJON PLC=                          3.000 E2     1.900 E2      0.200 E2

                                       Total:  AIR=                           6.000 E2     3.100 E2      0.900 E2

                                   Total:  CHLORINE=                          6.000 E2     3.100 E2      0.900 E2

                         Total:  THE CHEMICAL INDUSTRY=                       6.000 E2     3.100 E2      0.900 E2

                                     Total:  AVON=                            6.000 E2     3.100 E2      0.900 E2
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